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PEAO8_AMD_6

Separation of Sugars Using Deep Eutectic Solvents

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The solubility of glucose and fructose in two deep eutectic solvents (DES) at different temperatures was studied. Both DESs were based on the combination of choline chloride as the salt and glycerol or ethyline glycol to form Glyceline or Ethaline respectively. It was found that both DESs dissolve different amounts of glucose and fructose. Furthermore, ethaline may dissolve larger amount of sugars, ~90 wt% at 25 °C, than some of the best ionic liquids; however, both monosaccharides are more soluble in water. The difference in solubility was used to separate a mixture of solid fructose and glucose. The separated glucose was of 99 wt%and the DES could be recycled.

PEAO9_AMD_1

Purification and Cytotoxicity Assay of Tomato (Lycopersicon Esculentum) Leaves Methanol Extract as Potential Anti-Cancer Agent

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This research studied the cytotoxicity effect of tomato leaves methanol extract on cancer cells to address potential therapeutic in MCF-7 breast cancer cell lines and its toxicity towards Vero cells. The extraction was done in a shake flask by 82% methanol, 1:10 (w/v), agitated at 22 °C with 110 rpm within 24 hours. Later, purification process was started by thin layer chromatography (TLC) subjected to determine the best mobile phase for compound separation and collection by means of column chromatography. Next, the effect of purified sample towards MCF-7 breast cancer cell lines and Vero cells were observed using in vitro cytotoxicity assay to indicate its active fractions and its half maximal inhibitory concentration (IC50). Purified sample gave a rational effect towards MCF-7 breast cancer cells with IC50 value of 5.85 µg/ml compared to Taxol with IC50 value of 0.039 µg/ml. The purified sample can also be judged to be harmless as it has IC50 value of 765.6 µg/ml in Vero cells treatment while Taxol gave IC50 value of 0.045 µg/ml.

PEAO9_AMD_2

Oil Palm Bio-Fiber Reinforced Thermoplastic Composites-Effect Matrix Modification on Mechanical and Thermal Properties

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Nowadays, there are competing product development based on natural fiber which renewable, environmentally acceptable, and biodegradable reinforcing fiber. Also, combine acceptable mechanical properties with a low density. The major challenge for natural fiber composites is their inherent poor adhesion between fiber and the matrix, high moisture absorption and UV degradation. Lignin and hemicelluloses are the components of natural fiber which are mostly responsible for moisture absorption and UV degradation. In this study the lignocelluloses (Oil Palm Empty Fruit Bunch) were treated with alkaline peroxide to remove lignin and hemicelluloses. Composites were produced with treated and untreated fiber using up to 45% fiber with polypropylene (PP) matrix using Twin-screw extruder followed by injection molding. Composites were characterized using tensile and flexural testing, SEM and TGA. The tensile and flexural modulus were found to be higher for alkaline peroxide treated fiber composites compared to untreated fiber composites. To improve interfacial bonding, additional of coupling agents also found to provide higher strength and modulus of composites.

PEAO9_AMD_3

Stability Analysis of the Superoxide Ion Generated in Trihexyl (Tetradecyl) Phosphonium Bis (Trifluoromethylsulfonyl) Imide Ionic Liquid

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Superoxide ion has been generated in ionic liquid trihexyl (tetradecyl) phosphonium bis (trifluoromethylsulfonyl) imide, [P14,666][N(Tf)2]. Cyclic voltammetry and chronoamperometry techniques were used for the electrochemical generation of $O_2^{\bullet-}$, while chemical generation was done by adding KO_2 to DMSO. The long term stability of $O_2^{\bullet-}$ was investigated using UV/Vis spectrophotometer. It was found that the quaternary phosphonium cation, [P14,666]+ is a reasonably safe cation for the generation of $O_2^{\bullet-}$ which indicates the possible use of ILs involving it for further useful applications.

PEAO9_AMD_4

Empirical Model to Predict Mechanical Properties of MDF Panels From the Mean Density

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In Malaysia there are 13 big medium density fiberboard plant and 16 particleboard plants.A large amount of wood panels are rejected due to lack of proper understanding of internal process inside the board and its relationsip with the physical properties. Hot pressing is one of the critical operations during manufacturing of medium density fibreboard (MDF). In the hot pressing, moisture, mass transfer, heat transfer and fibre densification interact, resulting in continuing changes in mat physical, chemical and mechanical properties. In order to better understand the hot pressing process, both empirical investigation and theoretical modelling can be performed. The advantage of the empirical approach is that it takes less time although the result is applicable only in the range of conditions tested This paper presents an empirical model developed based